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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/743,897	01/17/2001	Russell Noble	124-834	8600

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EXAMINER

TUGBANG, ANTHONY D

ART UNIT	PAPER NUMBER
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3729

DATE MAILED: 02/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/743,897

Applicant(s)

NOBLE ET AL.

Examiner

A. Dexter Tugbang

Art Unit

3729

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) 1-15 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 16-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>1/27/01</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Group II, Claims 16-24 in Paper No. dated 7/10/2003 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).
2. Claims 1-15 have been withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the response filed 8/11/03.

Specification

3. The abstract of the disclosure is objected to because the abstract is not one paragraph (on page 25 of the specification) is not directed to the claimed invention, i.e. method of manufacture. Correction is required. See MPEP § 608.01(b).
4. Applicant is reminded of the proper content of an abstract of the disclosure.

A patent abstract is a concise statement of the technical disclosure of the patent and should include that which is new in the art to which the invention pertains. If the patent is of a basic nature, the entire technical disclosure may be new in the art, and the abstract should be directed to the entire disclosure. If the patent is in the nature of an improvement in an old apparatus, process, product, or composition, the abstract should include the technical disclosure of the improvement. In certain patents, particularly those for compounds and compositions, wherein the process for making and/or the use thereof are not obvious, the abstract should set forth a process for making and/or use thereof. If the new technical disclosure involves modifications or alternatives, the abstract should mention by way of example the preferred modification or alternative.

The abstract should not refer to purported merits or speculative applications of the invention and should not compare the invention with the prior art.

Art Unit: 3729

Where applicable, the abstract should include the following:

- (1) if a machine or apparatus, its organization and operation;
- (2) if an article, its method of making;
- (3) if a chemical compound, its identity and use;
- (4) if a mixture, its ingredients;
- (5) if a process, the steps.

Extensive mechanical and design details of apparatus should not be given.

5. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

6. The disclosure is objected to because of the following informalities: the specification does not provide for any Headings, i.e. Background of the Invention, Summary of the Invention, etc.

Appropriate correction is required.

The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.

Art Unit: 3729

- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC (See 37 CFR 1.52(e)(5) and MPEP 608.05. Computer program listings (37 CFR 1.96(c)), "Sequence Listings" (37 CFR 1.821(c)), and tables having more than 50 pages of text are permitted to be submitted on compact discs.) or
REFERENCE TO A "MICROFICHE APPENDIX" (See MPEP § 608.05(a). "Microfiche Appendices" were accepted by the Office until March 1, 2001.)
- (e) BACKGROUND OF THE INVENTION.
 - (1) Field of the Invention.
 - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (f) BRIEF SUMMARY OF THE INVENTION.
- (g) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (h) DETAILED DESCRIPTION OF THE INVENTION.
- (i) CLAIM OR CLAIMS (commencing on a separate sheet).
- (j) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (k) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

Claim Objections

7. Claims 18 and 19 are objected to because of the following informalities.

In Claim 18, the phrase of "a movable member" (line 2) should be recited as --the movable member--.

In Claim 19, the phrase of "a mobile state" (line 2) should be recited as --the mobile state--.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

Art Unit: 3729

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

9. Claims 17, 19 and 21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In Claim 17, the phrase of “the whole of the sacrificial material” (lines 2-3) lacks positive antecedent basis.

In Claim 19, it is unclear if the recitation of “a movable polymer membrane” (line 3) is referring to the previous recitation of the “polymer coating defining a movable member” (line 5 of Claim 10). How many movable members are there?

In Claim 21, the phrase of “the membrane” (line 2) lacks positive antecedent basis. Furthermore, what is meant by the phrase of “the material” (line 3) because there are several previous recitations of material, such as “contact pad material” (line 2) or “sacrificial material” (line 2 of Claim 16).

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. Claims 16-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Welbourn et al 5,262,000.

Art Unit: 3729

Welbourn discloses a method comprising: applying a sacrificial material 4 (in Fig. 4) to a substrate 1 of semiconductor material of silicon; applying a polymer coating (polysilicon layer 7) over part of the sacrificial material and the substrate (see Fig. 4); removing the sacrificial material 4 to leave a portion of the polymer coating defining a movable member (in Fig. 5) where the movable member defines a single cavity 13 (in Fig. 6) and in which the polymer coating is applied in a mobile state by CVD deposition to a thickness of 2 μm (see col. 4, lines 18-20).

Regarding Claim(s) 17, as best understood, the polymer coating 7 is applied over substantially the whole top surface of the substrate 1 and contacts the substrate around, or near, the cavity 13 (see Figs. 5 and 6).

Regarding Claim(s) 19, as best understood, the portion of the polymer coating 7 defining the movable member of Welbourn also includes additional layers 9, 10, 11, which also defines a “non-flat shape of a movable polymer membrane”. The sacrificial material 4 is removed after the movable polymer membrane has been established or formed (see sequence of Figs. 5 and 6).

Regarding Claim(s) 21, as best understood, the passivation layer 11 of Welbourn can be read as the claimed “top contact pad material” as this is applied over the top surface of the membrane and a material (of layer 3) is etched through a mask of the passivation layer to define a top contact pad (Al electrode 10, see sequence of Figs. 5 and 6).

With respect to the process steps being drawn to “an ultrasonic transducer”, these limitations recited in the preamble of the claims are intended use limitations and have not been given patentable weight since the body of the claims do not depend upon the preamble for

Art Unit: 3729

completeness and the process steps are able to stand alone. *In re Hirao*, 535 F.2d 67 190 USPQ 15 (CCPA 1976).

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claims 16, 19, 22, 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ella 5,714,917 in view of Nakanishi et al 4,296,349.

Ella discloses a method of producing an ultrasonic transducer comprising: applying a sacrificial material (ZnO layer 46 in Fig. 18c) to a substrate; applying a coating material (piezoelectric layer 52) over part of the sacrificial material and the substrate; and removing the sacrificial material 46 to leave a portion of the coating material defining a movable member wherein the member defines part of a single cavity (gap 62 in Fig. 19c) and the coating material is applied in a mobile state by deposition (see col. 10, lines 58+).

Regarding Claim(s) 19, Ella removes the sacrificial material 46 after a non-flat shape of the movable membrane has been established (see sequences of Figs. 18c and 19c).

Regarding Claim(s) 22 and 23, Ella further teaches producing a array of transducers on the same substrate or wafer (see col. 11, lines 44+) and that each transducer responds to various or different frequencies (see col. 12, lines 22+).

Art Unit: 3729

Regarding Claim(s) 24, Ella further teaches that it is conventional to have the transducer provided with an integrated semiconductor device, i.e. voltage capacitor, with the signal processing means, i.e. circuitry, on the same substrate (see col. 1, lines 35-44).

In summary above, Ella teaches substantially all of the limitations of the claimed manufacturing method except that the “coating material” is applied as a polymer such that the coating material 52 can be said to be a “polymer coating”. It is noted that the coating material 52 of Ella has piezoelectric properties or is a piezoelectric material.

Nakanishi suggests that it is conventional, old, and notoriously well known in the art of manufacturing ultrasonic transducers to provide coated materials of piezoelectric properties with various types of polymers at least for the advantages of having low acoustic impedance (see col. 1, lines 10-23).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the coated material of Ella by applying the coated material with a polymer composition such that the material is a “polymer coating”, as taught by Nakanishi, to positively allow the transducer to operate with low impedance.

Conclusion

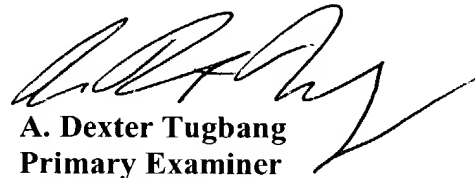
14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to A. Dexter Tugbang whose telephone number is 703-308-7599. The examiner can normally be reached on Monday - Friday 7:00 am - 3:30 pm.

Art Unit: 3729

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Vo can be reached on 703-308-1789. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



A. Dexter Tugbang
Primary Examiner
Art Unit 3729

February 5, 2004